MATERIALS SAFETY DATA SHEET (MSDS) Acetaldehyde (CH3CHO or C2H4O.)	MSDS Number:	
	Version number:	
	Date issued:	
	Page No:	

1. Product Identification

Trade Name	Acetaldehyde
Other means of identification - Synonyms	Ethanal; Ethyl aldehyde; Acetic aldehyde; Acetaldehyde (I); Ethanal (I); ACETIC ETHANOL; Eastman Acetaldehyde; Acetaldehyde (CAS 75-07-0); Aldehyde ethylique;Aldehyde acetique; Acetylhydride
CAS No	75-07-0
Recommended use	Synthetic/Analytical chemistry.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer Supplier	
E-Mail	
Contact Person	
Emergency Telephone	

2. Hazard(s) identification

OSHA/HCS status	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	
FLAMMABLE LIQUIDS	Category 1

EYE IRRITATION	Category 2A
CARCINOGENICITY	Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation)	Category 3

GHS label elements Hazard pictograms

Signal word **Danger**

Hazard statements	Extremely flammable liquid and vapor.Causes serious eye irritation.May cause respiratory irritationSuspected of causing cancer.May form explosive mixtures with air.
Precautionary statements	
General	Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.
Prevention	Obtain special instructions before use. Wear protective gloves. Wear protective clothing. Wear eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating or lighting equipment. Use non-sparking tools. Take action to prevent static discharges. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash thoroughly after handling.
Response	Call a POISON CENTER or doctor if you feel unwell. IF exposed or concerned: Get medical advice or attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention.
Storage	Store locked up. Store in a well-ventilated place. Keep container tightly closed. Keep cool.
Disposal	Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise classified	None known.

3. Composition and ingredient information

Chemical name	CAS number	%
acetaldehyde	75-07-0	99

4. First-aid measures

Eye Contact:	Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists. Promptly wash eyes with plenty of water while lifting the eye lids.
Skin Contact:	Take off immediately all contaminated clothing. Get medical attention if irritation develops and persists. Wash skin thoroughly with soap and water for several minutes.
Inhalation:	If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. For breathing difficulties, oxygen may be necessary. Call a physician if symptoms develop or persist.
Ingestion:	Call a physician or poison control center immediately. If swallowed, rinse mouth with water (only if the person is conscious). Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs.
Most important symptoms/effects, acute and delayed:	May cause drowsiness and dizziness. Headache. Nausea, vomiting. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Skin irritation. May cause redness and pain.
Indication of immediate medical attention and special treatment needed:	Not available
General information:	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Extinguishing media

Suitable Extinguishing Media:	Use dry chemical, CO_2, water spray (fog) or foam.
Unsuitable Extinguishing Media	Do not use water jet.
Specific hazards arising from the chemical	Extremely flammable liquid and vapor. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and willspread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.
Hazardous thermaldecomposition products	Decomposition products may include the following materials:carbon dioxidecarbon monoxide

Special Protective Actions for Firefighters	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use waterspray to keep fire-exposed containers cool.
Special Protective Equipment for Firefighters	Fire-fighters should wear appropriate protective equipment and self-contained breathingapparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergencypersonnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel fromentering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For nonemergency personnel"
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmentalpollution (sewers, waterways, soil or air).
Methods and materials for containment and cleaning up	
Small spill	Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place incontainer for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose thesame hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

Precautions for safe handling	Prevent formation of gases and vapours in flammable or explosive concentrations. The product should be used only in the areas where it is not in contact with open fire and other ignition sources. Use non-sparking tools. Use of antistatic clothes and footwear is recommended. Do not inhale mist/vapours/spray. Prevent contact with skin and eyes. No smoking. Obtain special instructions before use. Wash hands and exposed parts of the body thoroughly after handling. Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well- ventilated area. Use personal protective equipment as per Section 8. Observe valid legal regulations on safety and health protection. Ground and bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Take action to prevent static discharges. Avoid release to the environment.
Conditions for safe storage, including any incompatibilities	Store in tightly closed containers in cold, dry and well-ventilated areas designated for this purpose. Do not expose to sunlight. Store locked up. Keep container tightly closed. Keep cool. Storage class 3A - Flammable liquids (flash point below 55 °C)
The specific requirements or rules relating to the substance/mixture	Solvent vapours are heavier than air and accumulate especially near the floor where they may form an explosive mixture with the air.
Specific and Uses (s)	Not Available

8. Exposure Control / Personal Protection

Ingredient name	Exposure limits
Acetaldehyde	ACGIH TLV (United States, 3/2019). C: 45 mg/m^3 C: 25 ppm OSHA PEL (United States, 5/2018). TWA: 360 mg/m^3 8 hours. TWA: 200 ppm 8 hours. OSHA PEL 1989 (United States, 3/1989). STEL: 270 mg/m^3 15 minutes. STEL: 150 ppm 15 minutes. TWA: 180 mg/m^3 8 hours. TWA: 100 ppm 8 hours.

Appropriate engineeringcontrols	Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
Environmental exposurecontrols	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In somecases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures	
Hygiene measures	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
Eye/face protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists,gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side shields.
Skin protection	
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this isnecessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for differentglove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Body protection	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Other skin protection	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other importantaspects of use.

9. Physical and chemical properties

Appearance

Physical state	Liquid. [COLORLESS LIQUID OR GAS WITH A PENETRATING, FRUITY ODOR]
Color	Colorless.
Odor	Pungent.
Odor threshold	0.21 ppm
pH	Not available.
Melting point	-123.37°C (-190.1°F)

Critical temperature	187.85°C (370.1°F)
Flash point	Closed cup: -39°C (-38.2°F)
Evaporation rate	Not available.
Flammability (solid, gas)	Not available
Lower and upper explosive (flammable) limits	Lower: 4%Upper: 60%
Vapor pressure	120 kPa (900.07 mm Hg) [room temperature]
Vapor density	1.5 (Air = 1)
Specific Volume (ft 3/lb)	Not available
Gas Density (lb/ft 3)	Not available.
Relative density	0.78
Solubility	Not available
Solubility in water .	Not available.
Partition coefficient: n-octanol/water	0.45
Auto-ignition temperature	175°C (347°F)
Decomposition temperature	Not available.
Viscosity	Not available
Flow time (ISO 2431)	Not available.
Molecular weight	44.06 g/mole
Aerosol product	
Heat of combustion	-24655600 J/kg

10. Stability and reactivity

Reactivity	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
Incompatible materials	Reactive or incompatible with the following materials:oxidizing materials

Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products shouldnot be produced.
Hazardous polymerization	Under normal conditions of storage and use, hazardous polymerization will not occur.

11. Toxicological information

Acute toxicity

Oral	75-07-0	Lowest observable effect level Oral - rat - 675 mg/kg
Inhalation	75-07-0	LC50 Inhalation - rat - 4 h - 13300 ppm
Dermal	75-07-0	LD50 Dermal - rabbit - 3,540 mg/kg
Chronic Toxicity		No additional information.
Corrosion Irritation:		
Dermal:	75-07-0	Skin - rabbit Result: Mild skin irritation
Sensitization:	No additional information.	
Single Target Organ (STOT):	75-07-0: May cause respiratory irritation.	
Numerical Measures:	No additional information.	
Carcinogenicity:	75-07-0 : This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.	
Mutagenicity:	Mutagenic effects have occurred in experimental animals. Mutation in Mammalian Somatic Cells: Human	
Reproductive Toxicity:	Experiments have shown reproductive toxicity effects on laboratory animals.	

12. Ecological information

Ecotoxicity

75-07-0 : LC50 - Pimephales promelas (fathead minnow) - 31 mg/l - 96 h
75-07-0: Immobilization EC50 - Daphnia magna (Water flea) - 57.4 mg/l - 48 h
75-07-0 : Growth inhibition EC50 - Pseudokirchneriella subcapitata (green algae) - > 100 mg/l - 24 h

Persistence and degradability	75-07-0: Biotic/Aerobic - Exposure time 14 d Result: 80 % - Readily biodegradable.In the atmosphere it will degrade in a matter of hours by reaction with hydroxyl radicals and photolysis. If released into water it will rapidly biodegrade and volatilize (half-life 3 hrs for a typical river). If spilled on land it will also rapidly evaporate and leach into the ground where it will biodegrade.
Bio accumulative potential:	Not available.
Mobility in soil:	Not available.
Other adverse effects:	75-07-0: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life.

13. Disposal considerations

Disposal methods	The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1089	UN1089	UN1089	UN1089	UN1089
UN proper shipping name	ACETALDEHYDE	ACETALDEHYDE	ACETALDEHYDE	ACETALDEHYDE	ACETALDEHYDE
Transport hazard class(es)	3 	3 	3 	3 	3 
Packing group	1	1	1	1	1
Environmental hazards	No.	No.	No.	No.	No.

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Additional information

DOT Classification	**Reportable quantity**:1000 lbs / 454 kg [153.76 gal / 582.05 L]. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
	Limited quantity:Yes.
	Quantity limitation:Passenger aircraft/rail: Forbidden. Cargo aircraft: 30 L.
	Special provisions :A3, B16, T11, TP2, TP7
TDG Classification	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.18-2.19 (Class 3).
	Explosive Limit and Limited Quantity Index :0
	ERAP Index :3000
	Passenger Carrying Vessel Index :Forbidden
	Passenger Carrying Road or Rail Index Forbidden
IATA	**Quantity limitation** :Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: 30L.
Special precautions for user	**Transport within user's premises**: Always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
Transport in bulk according to IMO instruments	Not available.

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

Authorisations and/or restrictions on use	
Authorisations and/or restrictions on useREACH - Restrictions on the manufacture,placing on the market and use of certaindangerous substances, mixtures and articles(Annex XVII)	Acetaldehyde
National legislationSeveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	FLAMMABLE LIQUIDS

Other regulations	Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable. Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out

16. Other Information

History

Product name
Product code
Date of printing
Date of issue/Date of revision
Date of previous issue
Version
Prepared by

17. Change Details